

An International Journal
**computers &
mathematics**
with applications

Editor-in-Chief: Ervin Y. Rodin

List of Contents and Author Index

Volume 23, 1992



pergamon press

oxford · new york · seoul · tokyo

An International Journal
**computers &
mathematics** WITH APPLICATIONS

Editor-in-Chief:
Ervin Y. Rodin

Editorial Assistant: **Florence A. Schick**

Department of Systems Science and Mathematics
Campus Box 1040, Washington University
1 Brookings Drive, St Louis
MO 63130, U.S.A.

Tel.: 314-935-6007 or 935-5806

Fax: 314-935-4434

E.mail: rodin@rodin.wustl.edu

uunet!wuarchive!rodin.wustl.edu!rodin

rodin%rodin.wustl.edu@wugate.wustl.edu

Publishing Office

Pergamon Press Ltd, Pergamon House, Bampfylde Street,
Exeter EX1 2AH, England [Tel. (0392) 51558; Fax 425370].

Advertising and Subscription Offices

North America: Pergamon Press Inc., 395 Saw Mill River
Road, Elmsford, NY 10523, U.S.A.

Rest of the World: Pergamon Press Ltd, Headington Hill Hall,
Oxford OX3 0BW, England [Tel. (0865) 794141; Fax 60285].

Published 2 issues/month in 2 volumes

Subscription Rates

Annual institutional subscription rate (1992): £805.00
(US\$1460.00). Two-year institutional rate (1992/93):
£1529.50 (US\$2774.00). Sterling prices are definitive. U.S.
dollar prices are quoted for convenience only, and are
subject to exchange rate fluctuation. Prices include postage
and insurance and are subject to change without notice.
Subscription rates for Japan are available on request.
Members of the *American Mathematical Society* may order
personal subscriptions at a concessional rate, details of this
rate are available upon request.

Back Issues

Back issues of all previously published volumes, in both
hard copy and on microform, are available direct from
Pergamon Press offices.

Copyright © 1992 Pergamon Press Ltd

Application to mail at second class postage rate is pending
at RAHWAY NJ. Postmaster send address corrections to
Computers & Mathematics with Applications, c/o Pergamon
Press Inc., 395 Saw Mill River Road, Elmsford, NY 10523,
U.S.A.

It is a condition of publication that manuscripts submitted
to this journal have not been published and will not be
simultaneously submitted or published elsewhere. By
submitting a manuscript the authors agree that the copy-
right for their article is transferred to the publisher if and
when the article is accepted for publication. However,
assignment of copyright is not required from authors who
work for organizations which do not permit such assign-
ment. The copyright covers the exclusive rights to reproduce
and distribute the article, including reprints, photographic
reproductions, microform or any other reproductions of
similar nature and translations. No part of this publication
may be reproduced, stored in a retrieval system or trans-
mitted in any form or by any means, electronic, electrostatic,
magnetic tape, mechanical, photocopying, recording or
otherwise, without permission in writing from the copyright
holder.

**PHOTOCOPYING INFORMATION FOR
USERS IN THE U.S.A.**

The Item-fee Code for this publication indicates that auth-
orization to photocopy items for internal or personal use is
granted by the copyright holder for libraries and other users
registered with the Copyright Clearance Center (CCC)
Transactional Reporting Service provided the stated fee
for copying beyond that permitted by Section 107 or 108 of
the U.S. Copyright Law is paid. The appropriate remittance
of \$5.00 per copy per article is paid directly to the Copyright
Clearance Center Inc., 27 Congress Street, Salem, MA 01970,
U.S.A. The copyright owner's consent does not extend to
copying for general distribution, for promotion, for creating
new works, or for resale. Specific written permission must be
obtained from the publisher for such copying.

The Item-fee Code for this publication is:
0097-4943/92 \$5.00 + 0.00

List of Contents

NUMBER 1

E. Y. Rodin	1 Speed of publication—An editorial
T.-W. Hou, S. R. Tsai and L. M. Tseng	3 Adaptive and fault-tolerant routing algorithms for high performance 2D torus interconnection network
R. Rach, G. Adomian and R. E. Meyers	17 A modified decomposition
M. S. El Naschie	25 Peano dynamics as a model for ergodic and strange nonchaotic behaviour
J. Rifà i Coma	35 All s -sums of type 2 or 3 are triple-sum sets
S. B. Pomeranz	45 A solitary wave application of an iterative method for nonlinear elliptic eigenvalue problems
G. Adomian and R. Rach	51 A further consideration of partial solutions in the decomposition method
J.-Y. Liu and H.-S. Yan	65 Geometry design of trapezoidal threaded variable pitch lead screws
S. González-Pinto, L. Casasús and P. González-Vera	75 Two uniform schemes for the singularly perturbed Riccati equation
K.-L. Chung	87 Solving hyperbolic PDE's on hypercubes
G. Tsiotras and C. S. Tapiero	89 WIP and CSP-1 quality control in a tandem queueing production system
M. Rouff	103 The computation of C^k spline functions
Y. Yavin, C. Frangos and J. P. Fourie	111 The performance of a projectile which uses a bang-bang type guidance law: Part 1

NUMBER 2-5

SEMANTIC NETWORKS IN ARTIFICIAL INTELLIGENCE (Part 1)

F. W. Lehmann	ix Preface
F. W. Lehmann	1 Semantic Networks

INVITED RESEARCH FAMILY SUMMARIES

S. L. Lytinen	51	Conceptual Dependency and its descendants
J. F. Sowa	75	Conceptual Graphs as a universal knowledge representation
N. Cercone, R. Goebel, J. de Haan and S. Schaeffer	95	The ECO Family
W. A. Woods and J. G. Schmolze	133	The KL-ONE Family
R. H. Thomason	179	NETL and subsequent path-based inheritance theories
Y. Wilks and D. Fass	205	The Preference Semantics Family
J. Mylopoulos	223	The PSN Tribe
S. C. Shapiro and W. J. Rapaport	243	The SNePS Family

ARTICLES

J. A. Hendler	277	Massively-parallel marker-passing in semantic networks
L. Shastri	293	Structured connectionist models of semantic networks
C. Brink and R. A. Schmidt	329	Subsumption computed algebraically
H. Mili and R. Rada	343	A model of hierarchies based on graph homomorphisms
G. McCalla, J. Greer, B. Barrie and P. Pospisil	363	Granularity hierarchies

NUMBER 6-9

SEMANTIC NETWORKS IN ARTIFICIAL INTELLIGENCE (Part 2)

J. A. Markowitz, J. T. Nutter and M. W. Evens	377	Beyond IS-A and PART-WHOLE: More semantic network links
B. M. Slator	391	Sense and preference
S. L. Lytinen	403	A unification-based, integrated natural language processing system
R. Rucker and T. A. Aldowaisan	419	A design approach for constructing engineering scenario maps
R. T. Hartley	441	A uniform representation for time and space and their mutual constraints

D. A. Randell and A. G. Cohn	459 Exploiting lattices in a theory of space and time
A. G. Cohn	477 Completing sort hierarchies
R. Wille	493 Concept lattices and conceptual knowledge systems
A. Hautamäki	517 A conceptual space approach to semantic networks
L. Padgham	527 Defeasible inheritance: A lattice based approach
E. Franconi, B. Magnini and O. Stock	543 Prototypes in a hybrid language with primitive descriptions
H. Ehrig, A. Habel and H.-J. Kreowski	557 Introduction to graph grammars with applications to semantic networks
R. Levinson	573 Pattern associativity and the retrieval of semantic networks
H. Boley	601 Declarative operations on nets
D. D. Roberts	639 The Existential Graphs
R. W. Burch	665 Valent aspects of Peircean Algebraic Logic
R. Marty	679 Foliated semantic networks: Concepts, facts, qualities
G. P. Zarri	697 The "descriptive" component of a hybrid knowledge representation language
R. Nado and R. Fikes	719 Saying more with frames: Slots as classes
A. C. Graesser, S. Gordon and L. E. Brainerd	733 QUEST: A model of question answering
	747 Index

NUMBER 10

E. Y. Rodin	1 Speed of publication—An editorial
L. Garnett and A. U. Tansel	3 Equivalence of the relational algebra and calculus for nested relations
S.-A. Yang and C.-K. Chen	27 Magnetohydrodynamic effects upon momentum transfer on a continuously moving flat plane
M. A. El-Affendi	35 Estimating computer performance metrics when the service and interarrival times are of the truncated normal type
Y. Yavin	41 A search for a randomly moving object: A numerical study
H. M. Srivastava, R. K. Saxena and Z. Hussain	51 Some generating functions for the Jacobi polynomials

Y. Yavin and C. Frangos	57	An optimal selection policy for a flexible manufacturing cell feeding several production lines
L. Lustman, B. Neta and W. Gragg	65	Solution of ordinary differential initial value problems on an intel hypercube
Y. Yavin and C. Frangos	73	Optimal selection and control strategies for a flexible manufacturing and assembly system
G. Adomian and R. Rach	79	Nonlinear transformation of series—Part II
M.-H. Chou	85	Hopf bifurcation in a reaction-diffusion system governed by the Fitz-Hugh-Nagumo equations
M. B. Boisen, Jr., G. V. Gibbs and Z. G. Zhang	99	An application of graph theory to the estimation of bond numbers in crystals

NUMBER 11

E. Y. Rodin	1	Speed of publication—An editorial
D. A. Murio, D. Hinestroza G. and C. E. Mejía	3	New stable numerical inversion of Abel's integral equation
C. Chiccoli, S. Lorenzutta and G. Maino	13	Concerning some integrals of the generalized exponential-integral function
M. Eck and D. Lasser	23	B-spline Bézier representation of geometric spline curves: Quartics and quintics
O. Rojo and R. Soto	41	New conditions for the additive inverse eigenvalue problem for matrices
J. A. Snyman, C. Frangos and Y. Yavin	47	Penalty function solutions to optimal control problems with general constraints via a dynamic optimisation method
J. Sztrik	57	Modelling of a single bus multiprocessor system operating in Markovian environments
Y. J. Wang, L. S. Shieh and J. W. Sunkel	67	Robust stabilization, robust performance, and disturbance attenuation for uncertain linear systems
F. Mazzia and D. Trigiante	81	Numerical methods for second order singular perturbation problems
J. L. Howland and R. Vaillancourt	91	Rational transformation from Schur to Jordan form

NUMBER 12

E. Y. Rodin	1	Speed of publication—An editorial
Y.-K. Kwok	3	Stability analysis of six-point finite difference schemes for the constant coefficient convective-diffusion equation
Ç. K. Koç	13	A parallel algorithm for exact solution of linear equations via congruence technique
J. P. Pascal	25	Similarity solutions for axisymmetric plane radial power law fluid flows through a porous medium
J. A. Sjogren	43	Closed-form solution of decomposable stochastic models
G. Vanden Berghe, H. De Meyer and M. Van Daele	69	A parallel approach to the modified Numerov-like eigenvalue determination for Sturm-Liouville problems
R. Vulanović and P. Lin	75	Numerical solution of quasilinear attractive turning point problems
Z. Michalewicz, C. Z. Janikow and J. B. Krawczyk	83	A modified genetic algorithm for optimal control problems
J.-C. Yao	95	Nonlinear inequalities in Banach spaces
	99	Book Reports